REMARKS

Claims 1-31 are pending in the application.

Claims 1-31 stand rejected.

Rejection of Claims under 35 U.S.C. § 102

Claims 1-31 stand rejected under 35 U.S.C. § 102(e) as being anticipated by Frank, et al.,

U.S. Patent No. 6,532,494 (Frank). While not conceding that the cited reference qualifies as

prior art, but instead to expedite prosecution, Applicants have chosen to respectfully disagree and

traverse the rejection as follows. Applicants reserve the right, for example, in a continuing

application, to establish that the cited reference, or other references cited now or hereafter, do not

qualify as prior art as to an invention embodiment previously, currently, or subsequently

claimed.

As generally required by independent claim 28, independent claim 1 recites a method for

providing a coordinator virtual device corresponding to at least a portion of a physical
data storage device;
detecting when a computer system cluster, including a plurality of nodes, is partitioned;
attempting to gain control of the coordinator virtual device; and
removing at least one of the plurality of nodes from the computer system cluster when the
attempting is unsuccessful.

Regarding the claimed "providing a coordinator virtual device corresponding to at least a

portion of a physical data storage device," the final Office Action dated January 27, 2006 states

that Frank teaches a method for providing the coordinator virtual device through Frank's use of

the cluster manager. Specifically, in the final Office Action, at page 12, second sentence of

paragraph b, the Examiner equates Frank's cluster manager with Applicants' coordinator virtual

device when the final Office Action states that "Frank shows the use of a cluster manager, herein interpreted as a coordinator virtual device that oversees the removal and addition of nodes while considering whether or not the attempt to gain control of the coordinator virtual device is successful." Paradoxically, in other words, the Office Action states that the coordinator virtual device oversees the removal and addition of nodes while considering whether the attempt to gain control of itself is successful. Regardless of this contradiction, Applicants have proceeded with the following response.

Frank's cluster manager appears to be an intelligent device that "manages cluster connectivity in the computer network cluster 10" (Frank, col. 4, lines 32-33). Unlike Frank's cluster manager, Applicants respectfully submit that Applicants' coordinator virtual device corresponds to "at least a portion of a physical data storage device" (Applicants' claim 1). Along these lines, Applicants note that in the following sentences of paragraph b, page 12, the final Office Action appears to equate Applicants' coordinator virtual device with an alternate element of Frank, Frank's shareable storage 22. Specifically, to show the claimed coordinator virtual device, the final Office Action refers to Frank, col. 3, lines 34-45, which states the following:

> Here, shareable storage 22 has been illustrated as a single storage disk or the like. It should be understood by one of ordinary skill in the art that the shareable storage may include multiple storage devices. To implement multiple storage devices as the shareable storage 22, a header 25 of each storage device may include data indicating the identity of all devices comprising the shareable storage 22, a version number for information contained in the header 25, and any other pertinent data. To gain membership in the quorumless cluster 10, a node must have access to all storage devices comprising the shareable storage 22.
>
> Frank, col. 3, lines 34-45

Applicants respectfully submit that such use of Frank is inconsistent because the final Office Action refers to a second, separate element of Frank as equating to the coordinator virtual device. This inconsistency is inappropriate as a basis for a 102 rejection because a claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference (see MPEP § 2131). Although Frank is a single reference, two separate portions of Frank are used to depict the same claim element.

Regardless, even if (without admitting such) either of Frank's shareable storage 22 or Frank's cluster manager 32 were to equate to Applicants' coordinator virtual device, Frank does not teach, disclose, or otherwise suggest Applicants' claimed "attempting to gain control of the coordinator virtual device." In an effort to depict "attempting to gain control of the coordinator virtual device," the final Office Action refers to Frank, col. 3, lines 35-45; col. 5, lines 7-60; and col. 8, lines 43-48.

On the one hand, if the coordinator virtual device were to be equated to Frank's shareable storage 22, needing mere access to shareable storage 22 as taught by Frank at col. 3, lines 35-45 neither teaches nor suggests the need to or the attempt to gain control of shareable storage 22. Further, monitoring nodes through heartbeat messages as taught by Frank at col. 5, lines 7-60 does not address attempting to gain control of shareable storage 22. At most, nodes requiring access to shareable storage 22 to remain part of a cluster (see Frank, col. 10, lines 13-15 cited herein) are monitored through heartbeat messages. A cluster containing a node enters reconfiguration mode if, within a predetermined time interval, the node fails to receive a heartbeat message from one of the other nodes of the cluster (Frank, col. 5, lines 18-20). The cited portion of Frank is silent regarding an attempt to gain control of shareable storage 22. As best understood by Applicants, the cited portion of Frank merely depicts preventing nodes of a

cluster from accessing shareable storage 22 when cluster reconfiguration mode is entered (Frank, col. 5, lines 22-23). Attempting to control shareable storage 22 is not addressed.

On the other hand, if the coordinator virtual device were to be equated with Frank's cluster manager 32, Frank does not show attempting to gain control of the cluster manager 32, as would be required if the cluster manager 32 did in fact teach the claimed coordinator virtual device. Attempting such control does not occur nor does it make sense because, for example, in Frank, each and every node includes a cluster manager 32 (Fig. 2; col. 4, lines 21-26).

As discussed herein, regarding the claimed "removing at least one of the plurality of nodes from the computer system cluster when the attempting [to gain control of the coordinator virtual device] is unsuccessful," the cited portions of Frank fail to show a coordinator virtual device at all. Without a coordinator virtual device, Frank surely fails to show attempting to gain control of the coordinator virtual device. As a result, Frank does not show taking an action such as removing a node when the attempting to gain control of the coordinator virtual device is unsuccessful. However, for purposes of argument, even if the coordinator virtual device were equated with either the shared storage 22 or the cluster manager 32 of Frank, Frank fails to teach, disclose, or otherwise suggest Applicants' claimed removing.

In an effort to demonstrate "removing at least one of the plurality of nodes from the computer system cluster when attempting is unsuccessful," the final Office Action refers to Frank, col. 5, lines 7-60; and col. 10, lines 10-15. Applicants respectfully submit that, if (without admitting such) either of Frank's shareable storage 22 or Frank's cluster manager 32 were to equate to Applicants' coordinator virtual device, Frank does not teach, disclose, or otherwise suggest Applicants' claimed "removing."

Specifically, Frank, col. 5, lines 7-60 demonstrates monitoring of nodes through heartbeat messages and does not address "removing at least one of the plurality of nodes from the computer system cluster" much less removing a node "when the attempting [to gain control of the coordinator virtual device] is unsuccessful." Significantly, the cited portion of Frank is silent regarding the removal of nodes when attempting to gain control of a coordinator virtual device is unsuccessful.

Rather than showing removal of nodes under the claimed conditions, as discussed herein, the cited portion of Frank merely depicts entering cluster reconfiguration mode in which "all user applications executing on the network cluster are stalled until the cluster membership is once again verified" (Frank, col. 5, lines 21-23). *Verifying* cluster membership does not infer removing cluster nodes. Apparently to address this deficiency in the final Office Action, Frank, col. 10, lines 10-15 was cited.

> It should be noted that although network connectivity may have been lost in the quorumless cluster 10, the cluster managers of each member node 12, 14, 16, 18 communicate to each other through disk based messaging, specifically through the repository 46 of FIG. 4. As described above, *if a node loses access to the shareable storage 22, it removes itself from the quorumless cluster* 10.
>
> Frank, col. 10, lines 10-15 (italics added for emphasis)

Although the above paragraph of Frank discloses a node removing *itself* from a cluster if a node loses access to shareable storage 22, regardless of the definition from the Office Action that the Examiner might choose for the coordinator virtual device, the removal has nothing to do with a failed attempt to gain control of the coordinator virtual device. In addition, as previously discussed herein, even if (without admitting such) the coordinator virtual device were defined as shareable storage 22, the cited portion of Frank depicts merely accessing shareable storage 22.

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In other words, the Office Action inaccurately equates losing access with an unsuccessful attempt to gain control.

Thus, for at least the above reasons, Applicants urge the Examiner to withdraw the 35 U.S.C. § 102(e) rejection of independent claims 1 and 28 as being anticipated by Frank.

Regarding independent claim 15, a system is recited that comprises:

a first data storage device;

a virtual device configuration server coupled to the first storage device and including a first memory and a first processor configured to provide a coordinator virtual device corresponding to at least a portion of the first data storage device;

a plurality of virtual device configuration clients configured as a computer system cluster, at least one of the plurality of virtual device configuration clients including a second memory and a second processor configured to:

detect when the computer system cluster is partitioned;

attempt to gain control of the coordinator virtual device corresponding to at least a portion of the first data storage device; and

remove the at least one of the plurality of virtual device configuration clients from the computer system cluster when the attempt to gain control of the coordinator virtual device is unsuccessful.

Applicants note that in the final Office Action, further inconsistencies are apparent with regard to arguments of the final Office Action with respect to claim 15. In contradistinction to the multiple definitions used for Applicants' coordinator virtual device in the final Office Action with respect to Applicants' claim 1, the Examiner now refers to the same portions of Frank to demonstrate different distinct aspects of Applicants' claim 15. Specifically, in section 1 of the final Office Action, Frank col. 3, lines 34-45 was cited to demonstrate claim 1's "providing a coordinator virtual device... ." In contrast, section 15 of the final Office Action cites the same portions of Frank to demonstrate claim 15's "first data storage device." Applicants respectfully submit that such inconsistent use of Frank is inappropriate because uncertainty is introduced concerning the basis of the 102 rejection in the final Office Action.

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As best understood from the final Office Action, Applicants respectfully submit that some of Applicants' claim 1 arguments can apply to claim 15's claimed plurality of virtual device configuration clients configured to attempt to gain control of the coordinator virtual device. Further, other of Applicants' claim 1 arguments can apply to claim 15's claimed plurality of virtual device configuration clients configured to remove the at least one of the plurality of virtual device configuration clients when the attempt to gain control of the coordinator virtual device is unsuccessful.

Regarding the other elements of independent claim 15, the final Office Action states that the claimed "virtual device configuration server" is taught at Frank, col. 7, line 54 to col. 8, line 150 (pertaining to the referenced "col. 8, line 150" portion of Frank, Applicants have assumed that the Examiner intended to refer to all portions of Frank's column 8).

Applicants respectfully request the Examiner to explain how Frank's "flow diagram describing a process for updating a cluster definition" (see Frank, Fig. 5, and col. 7, lines 45-46) supports the rejection of Applicants' virtual device configuration server including a processor configured to provide a coordinator virtual device. Among other things, the cited passage says nothing concerning a processor configured to provide a coordinator virtual device. In the final Office Action, Applicants' attention is drawn to Frank col. 7, line 54 to col. 8, line 150, apparently, in an attempt to provide the missing support for the rejection of claim 15. However, Applicants respectfully submit that the cited portion of Frank does not provide the missing support for the rejection of the virtual device configuration server. In addition, as discussed herein, the cited portions of Frank are also deficient with respect to Applicants' coordinator virtual device. Thus, for at least these reason, Applicants urge the Examiner to withdraw the 35 U.S.C. § 102(e) rejection of claim 15 as being anticipated by Frank.

As dependent claims 2-14, 16-27, and 29-31 add limitations to these otherwise allowable base claims, Applicants respectfully request withdrawal of the 35 U.S.C. § 102(e) rejection to these claims as well.

CONCLUSION

In view of the amendments and remarks set forth herein, the application is believed to be in condition for allowance and a notice to that effect is solicited. Nonetheless, should any issues remain that might be subject to resolution through a telephonic interview, the Examiner is invited to telephone the undersigned at 512-439-5089.

I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail in an envelope addressed to: Mail Stop AF, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450, on March 27, 2006.
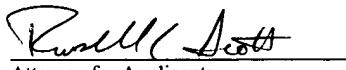
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